

Adult Immunization

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Outline

- **Disease burden and vaccine schedule**
- **Vaccine coverage**
- **Reasons for low immunization rates**
- **Strategies to increase immunization rates**
- **Update on influenza**



Disease Burden (1)

- **Influenza**
 - >200,000 hospitalizations per year
 - 36,000 deaths
 - >90% in persons 65 years and older
- **Invasive Pneumococcal Disease***
 - **Cases: 42,000 (14.0/100,000)**
 - **Deaths: 4,500 (1.5/100,000)**
 - Rates higher in elderly
- **Hepatitis B**
 - 51,000 new infections/yr; 95% in adults
 - 2,000 – 3,000 deaths/yr
 - ~1.25 million with chronic HBV infection

*Data Source: Active Bacterial Core Surveillance (ABCs), 2007-provisional. CDC Available at: <http://www.cdc.gov/ncidod/dbmd/abcs/survreports.spneu07.pdf>



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Disease Burden (2)

- **Human Papillomavirus (HPV)**
 - **Genital HPV is the most prevalent sexually transmitted infection in the US**
 - **At least 50% of sexually active persons acquire genital HPV infection at some point in their lives**
 - **~20 million currently infected**
 - **6.2 million new infections/year**
 - **Est. >11,000 new cervical cancer cases in 2008**



Disease Burden (3)

- **Herpes Zoster (Shingles)**
 - Reactivation of varicella zoster virus
 - Associated with normal aging and reduced immunocompetence
 - Lifetime risk of 20% in the U.S.
 - Est. 1 million cases/yr in the U.S.
- **Pertussis**
 - Of >25,000 cases reported in 2005, >7,000 were in adults
 - Most severe disease/deaths among infants less than 6 months
 - Source of infant infection often an older child or adult
 - 71% household contact



Recommended Adult Immunization Schedule

UNITED STATES · OCTOBER 2007–SEPTEMBER 2008

Note: These recommendations must be read with the footnotes that follow.

Figure 1. Recommended schedule for adult immunization, by vaccine and age group

VACCINE ▼	AGE GROUP ▶	19–49 years	50–64 years	≥65 years
Tetanus, diphtheria, pertussis (Td/Tdap) ^{1,*}		1 dose Td booster every 10 yrs		
		Substitute 1 dose of Tdap for Td		
Human papillomavirus (HPV) ^{2,*}		3 doses females (0, 2, 6 mos)		
Measles, mumps, rubella (MMR) ^{3,*}		1 or 2 doses	1 dose	
Varicella ^{4,*}		2 doses (0, 4–8 wks)		
Influenza ^{5,*}			1 dose annually	
Pneumococcal (polysaccharide) ^{6,7}		1–2 doses		1 dose
Hepatitis A ^{8,*}		2 doses (0, 6–12 mos or 0, 6–18 mos)		
Hepatitis B ^{9,*}		3 doses (0, 1–2, 4–6 mos)		
Meningococcal ^{10,*}		1 or more doses		
Zoster ¹¹				1 dose

*Covered by the Vaccine Injury Compensation Program.

For all persons in this category who meet the age requirements and who lack evidence of immunity (e.g., lack documentation of vaccination or have no evidence of prior infection)

Recommended if some other risk factor is present (e.g., on the basis of medical, occupational, lifestyle, or other indications)

Report all clinically significant postvaccination reactions to the Vaccine Adverse Event Reporting System (VAERS). Reporting forms and instructions on filing a VAERS report are available at www.vaers.hhs.gov or by telephone, 800-822-7967.

Information on how to file a Vaccine Injury Compensation Program claim is available at www.hrsa.gov/vaccinecompensation or by telephone, 800-338-2382. To file a claim for vaccine injury, contact the U.S. Court of Federal Claims, 717 Madison Place, N.W., Washington, D.C. 20005; telephone, 202-357-6400.

Additional information about the vaccines in this schedule, extent of available data, and contraindications for vaccination is also available at www.cdc.gov/vaccines or from the CDC-INFO Contact Center at 800-CDC-INFO (800-232-4636) in English and Spanish, 24 hours a day, 7 days a week.

Figure 2. Vaccines that may be indicated for adults based on medical and other conditions

INDICATION ▶ VACCINE ▼	Pregnancy	Immuno-compromising conditions (excluding HIV), medications, radiation ¹³	Human immunodeficiency virus (HIV) infection ^{3,12,13}		Diabetes, heart disease, chronic pulmonary disease, chronic alcoholism	Asplenia ¹² (including elective splenectomy and terminal complement component deficiencies)	Chronic liver disease	Kidney failure, end-stage renal disease, recipients of hemodialysis	Healthcare personnel
			CD4+ T lymphocyte count < 200 cells/uL	≥ 200 cells/uL					
Tetanus, diphtheria, pertussis (Td/Tdap) ^{1,*}	1 dose Td booster every 10 yrs Substitute 1 dose of Tdap for Td								
Human papillomavirus (HPV) ^{2,*}	3 doses for females through age 26 yrs (0, 2, 6 mos)								
Measles, mumps, rubella (MMR) ^{3,*}	Contraindicated		1 or 2 doses						
Varicella ^{4,*}	Contraindicated		2 doses (0, 4–8 wks)						
Influenza ^{5,*}	1 dose TIV annually								1 dose TIV or LAIV annually
Pneumococcal (polysaccharide) ^{6,7}	1–2 doses								
Hepatitis A ^{8,*}	2 doses (0, 6–12 mos, or 0, 6–18 mos)								
Hepatitis B ^{9,*}	3 doses (0, 1–2, 4–6 mos)								
Meningococcal ^{10,*}	1 or more doses								
Zoster ¹¹	Contraindicated		1 dose						

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 For all persons in this category who meet the age requirements and who lack evidence of immunity (e.g., lack documentation of vaccination or have no evidence of prior infection)

 Recommended if some other risk factor is present (e.g., on the basis of medical, occupational, lifestyle, or other indications)

These schedules indicate the recommended age groups and medical indications for which administration of currently licensed vaccines are commonly indicated for adults ages 19 years and older, as of October 1, 2007. Licensed combination vaccines may be used whenever any components of the combination are indicated and when the vaccine's other components are not contraindicated. For detailed recommendations on all vaccines, including those used primarily for travelers or that are issued during the year, consult the manufacturers' package inserts and the complete statements from the Advisory Committee on Immunization Practices (www.cdc.gov/vaccines/pubs/acip-list.htm).

The recommendations in this schedule were approved by the Centers for Disease Control and Prevention's (CDC) Advisory Committee on Immunization Practices (ACIP), the American Academy of Family Physicians (AAFP), the American College of Obstetricians and Gynecologists (ACOG), and the American College of Physicians (ACP).



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Adult Immunization Rates

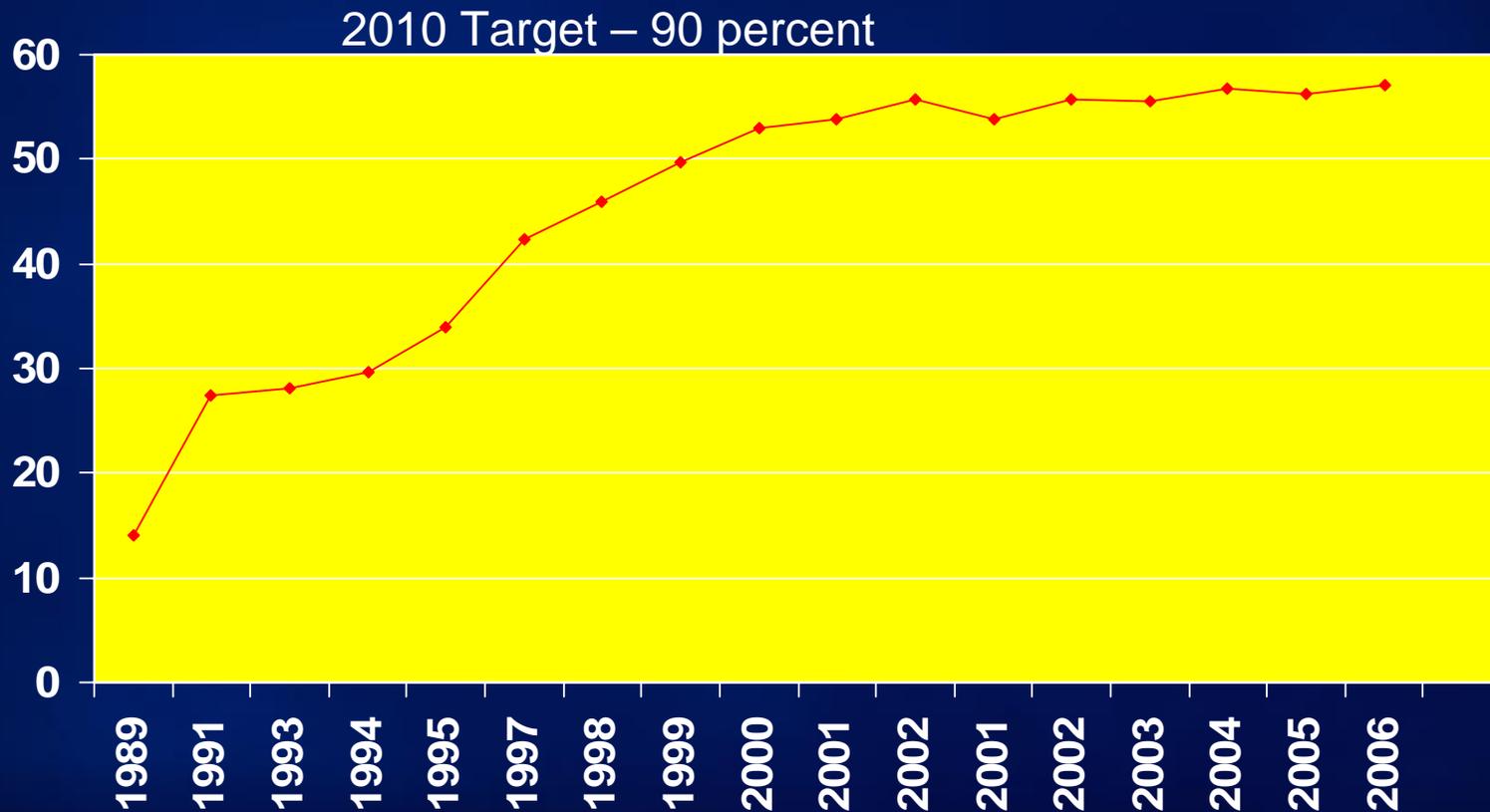


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Pneumococcal Vaccination Coverage Among Adults 65 Years and Older, 1989-2006



Source: National Health Interview Survey (NHIS), CDC, NHIS



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Changing Epidemiology of Invasive Pneumococcal Disease Among Older Adults

- Rates of IPD decreased from 1998-1999 to 2002-2003 for persons
 - > 85 years – 28%
 - 75-84 years – 35%
 - 65-74 years – 29%
 - 50-64 years – 17%
- Percentage declines similar for blacks and whites
- PCV7 serotype disease significantly lower; no change for disease caused by serotypes only in polysaccharide vaccine
- Estimated 6250 fewer cases and 550 fewer deaths

Lexau CA, et al. JAMA 2005;294:2043-2051

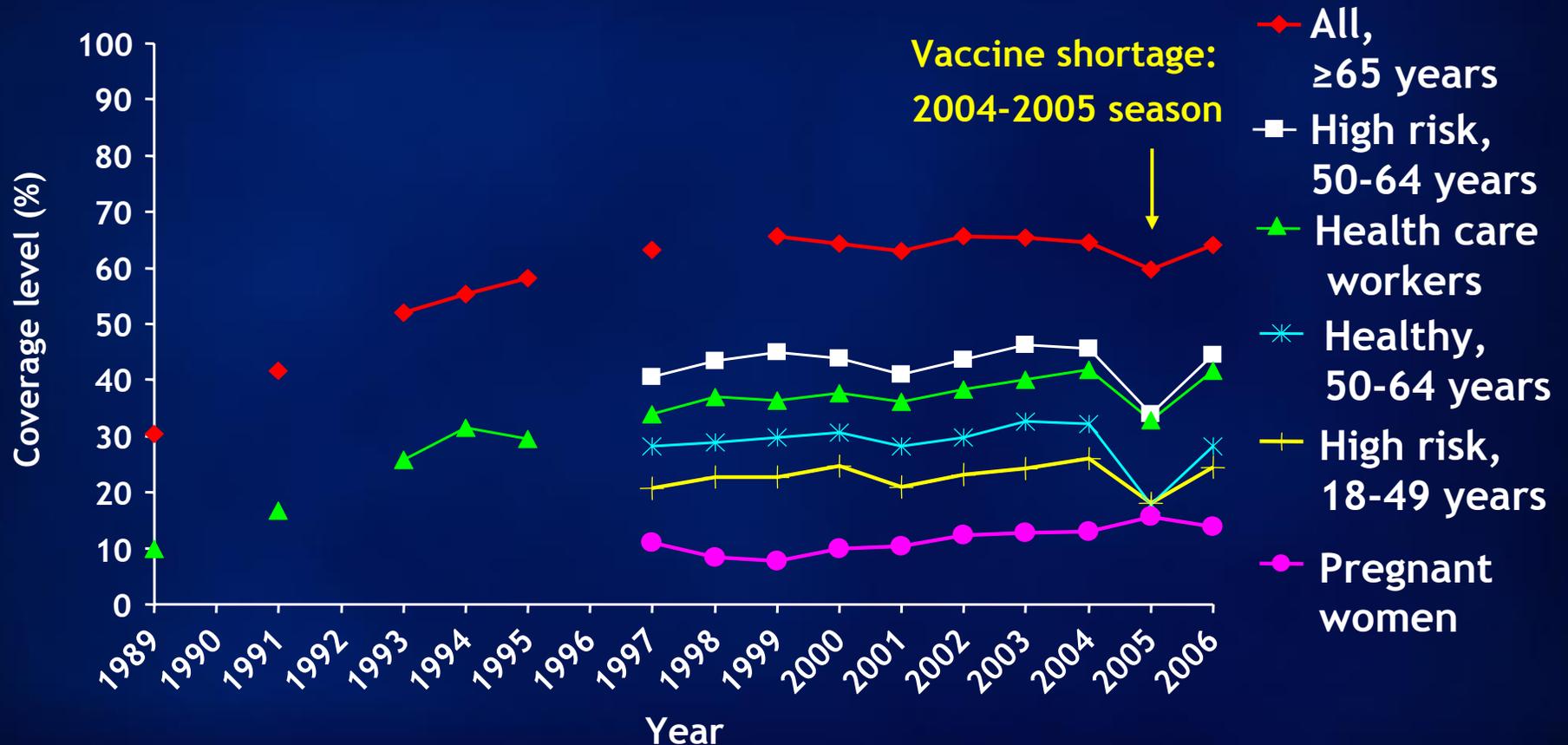


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Self-Reported Influenza Vaccination Within the Past 12 Months, Selected Priority US Populations, 1989-2006; National Health Interview Survey (NHIS)



Centers for Disease Control and Prevention. National Health Interview Survey—Self-Reported Influenza Vaccination Coverage Trends (1989-2006). <http://www.cdc.gov/flu/professionals/vaccination/pdf/vaccinetrend.pdf>. Accessed May 8, 2008.



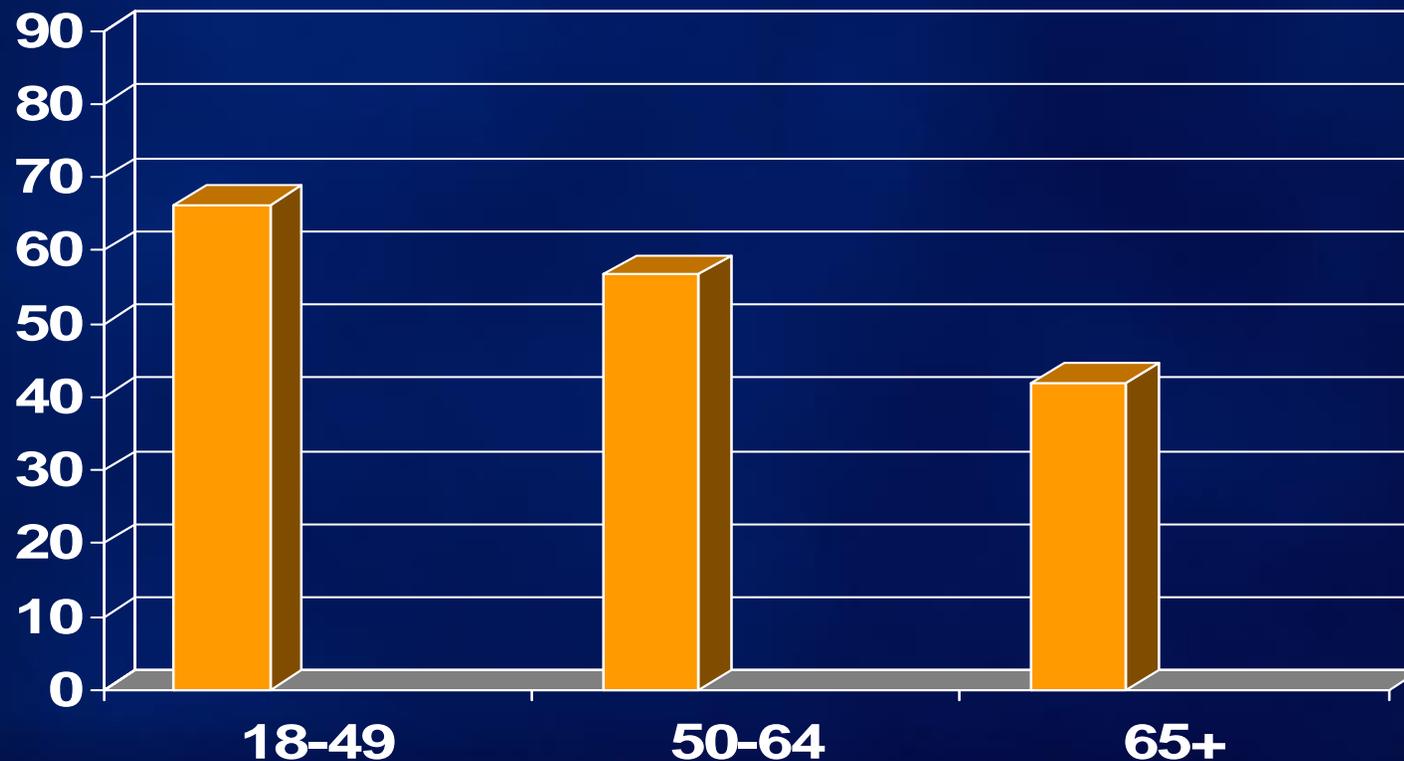
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Percentage of Adults Who Had Received a Tetanus Toxoid Vaccination During the Past 10 Years, by Age Group

Percent



Source: National Health Interview Survey (NHIS), CDC, NHIS 1999

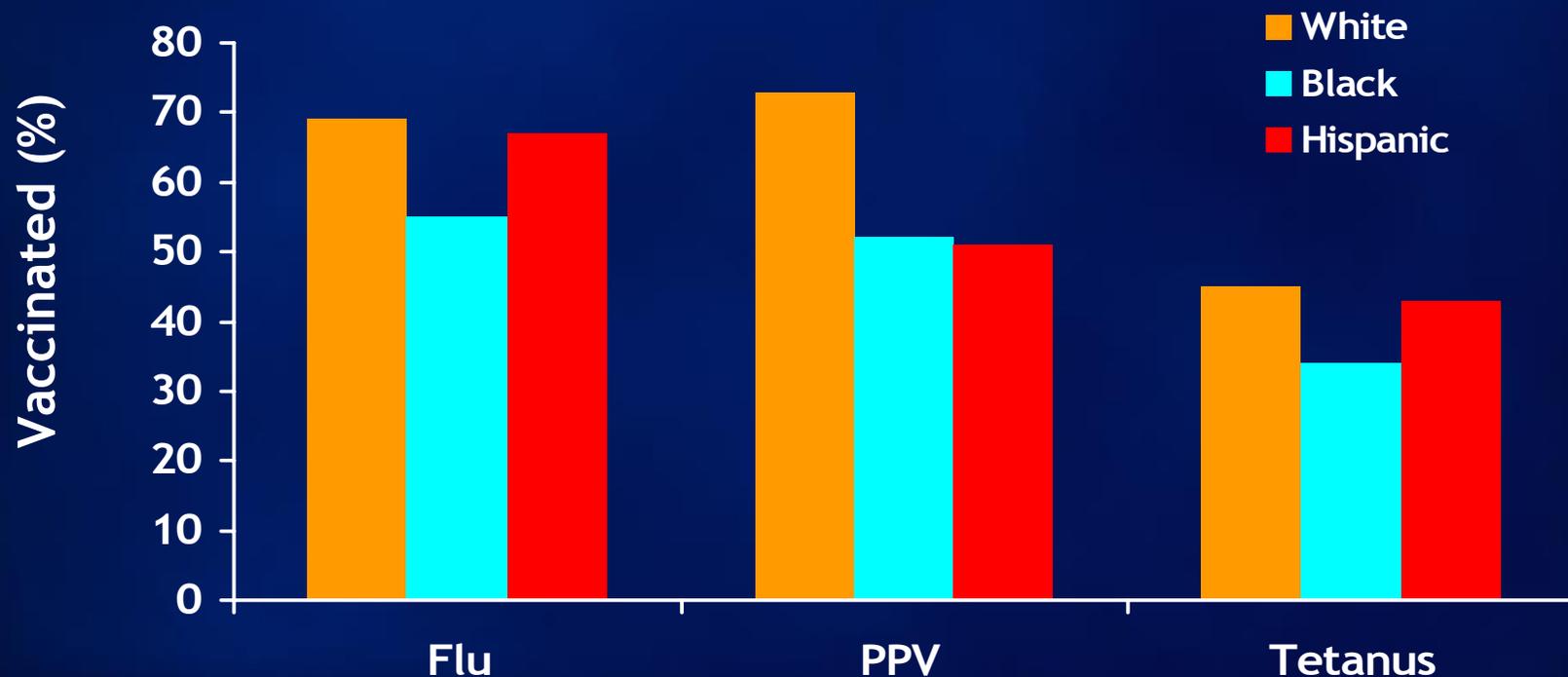


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Percentage of Vaccinated US Adults Aged ≥ 65 Years, by Race/Ethnicity: NIS–Adult 2007



Euler GL. Results of CDC's National Immunization Survey. Presented at: National Immunization Conference; March 20, 2008; Atlanta, GA.



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MMWRTM

Morbidity and Mortality Weekly Report

Early Release

February 9, 2006 / Vol. 55

Influenza Vaccination of Health-Care Personnel

Recommendations of the Healthcare Infection Control Practices Advisory Committee (HICPAC) and the Advisory Committee on Immunization Practices (ACIP)



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Reasons for Low Immunization Rates

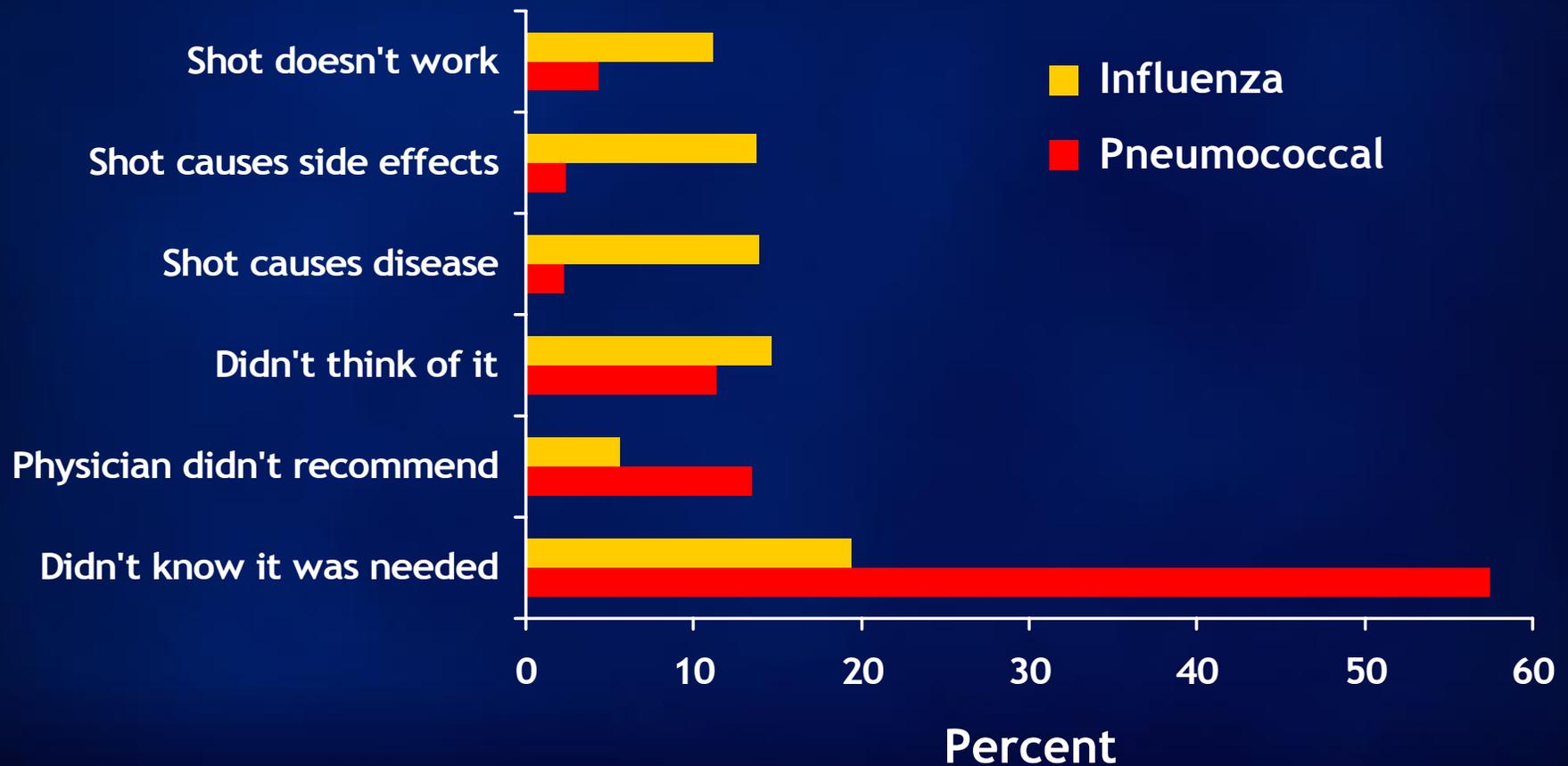


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Reasons for Not Getting Vaccinated: Medicare Beneficiary Survey



Centers for Disease Control and Prevention. *MMWR Morb Mortal Wkly Rep.* 1999;48:886-890.



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Physician Perception of Barriers to Adult Vaccination

Barrier	Pneumococcal Vaccination* (%)	Influenza Vaccination* (%)
Urgent concerns dominate visit	44	43
Do not know patient immunization history	36	12
Patient concern about vaccine safety	31	58
Inadequate reimbursement	25	26
Identification of eligible patients	21	13
Lack of patient-oriented vaccine information	20	20

*Percentage of physicians.

Szilagyi PG et al. *Prev Med.* 2005;40:152-161.



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Financing Public Sector (1)

- **Section 317 of the Public Health Service Act**
 - Discretionary grant program, through CDC to 64 state and local grantees
 - Vaccine purchase and program operations
 - No eligibility requirements
 - 317 funds can be used for children and adults, but children have received priority
 - 1997 was the first time grant guidance permitted funds to be specifically used for adults
 - In 2005, 4.5% of Section 317 funding purchased adult vaccines
 - Since 1999, level of funding relatively flat
- **State or local funds**
 - Wide variability in funding for adult vaccines



Financing Public Sector (2)

- **Medicaid**
 - <65 years
 - Administered at state level
 - Maximum allowable fee set by CMS for each state
 - Published in Federal Register September 1994
 - No change since 1994
 - No minimum administration fee
 - State contribution often less than maximum allowable fee
- **Medicare**
 - ≥ 65 years
 - Part B – influenza, pneumococcal, hepatitis B vaccines
 - Vaccine plus administration fee (~\$18 for one vaccine, \$10 for each additional vaccine)
 - Part D – other vaccines
 - Not all Part B beneficiaries have Part D
 - Reimbursement more complicated than Part B

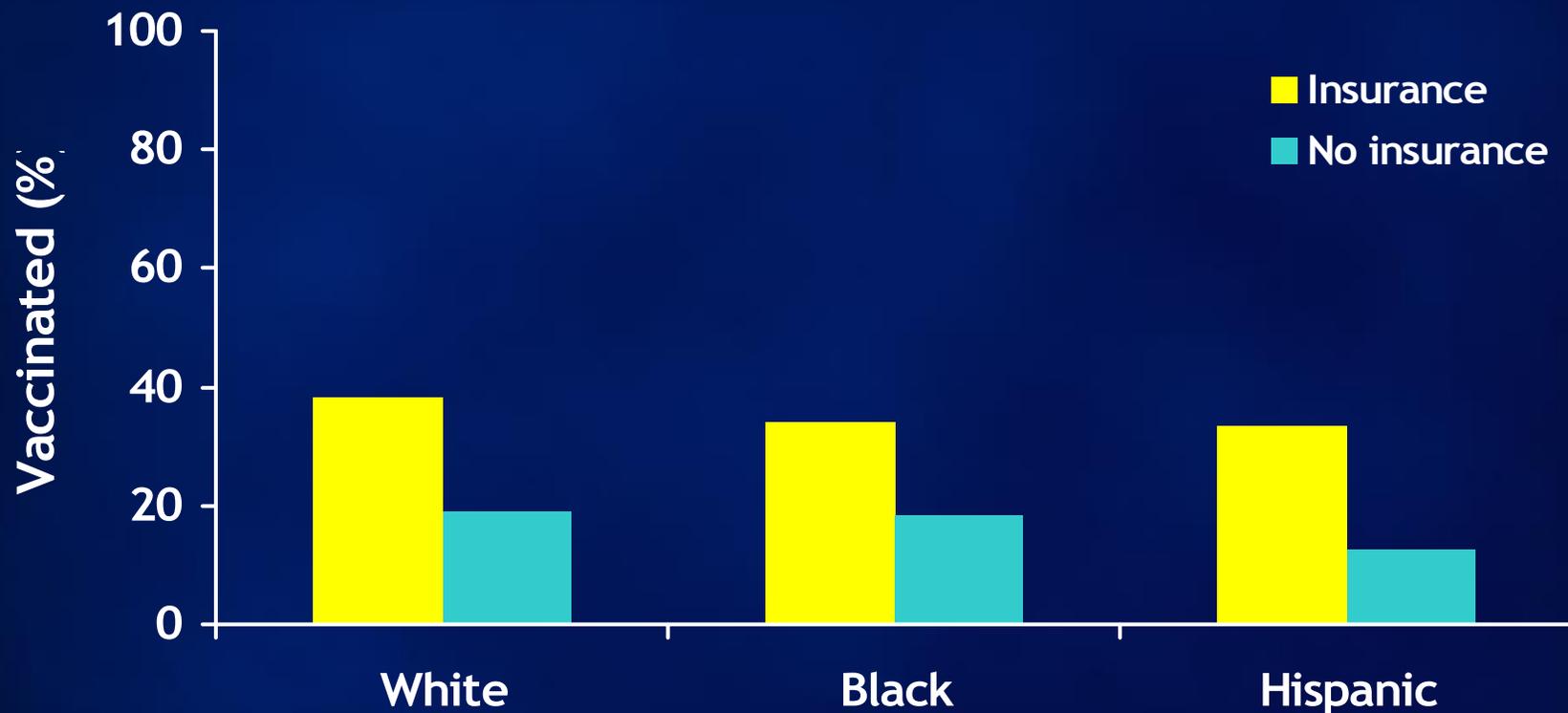


Financing Private Sector

- **Private insurance**
 - Most recommended vaccines covered
 - Self-insured employers less likely to provide immunization benefits
 - Possible delays in initiating coverage
 - Possible co-pays or deductibles
- **Out-of-pocket expenses**
 - Approximately 19.8% of adults 18-64 years (36.5 million) lack health insurance
 - 4.2% are uninsured and also living at or under 200% of the poverty level
- **Other**
 - Vaccine Patient Assistance Program



Influenza Vaccination Among High-Risk Adults Aged 18-64 Years, by Health Insurance Status



Centers for Disease Control and Prevention. *Morb Mortal Wkly Rep.* 2005;54:1045-1049.



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Physician Reimbursement* for Influenza Vaccination and Administration in Selected Years

Year	Administrative Reimbursement	Vaccine Reimbursement
2001	\$4.59	\$7.12
2002	\$3.98	\$7.12
2003	\$10.17	\$7.50
2005	\$18.00	\$10.40
2007	\$19.33	\$13.22

*All costs are approximate national averages.

Coleman MS et al. *Vaccine*. 2005;23:915-923; Courtesy of Mootrey GT, DO. Unpublished data, 2008.



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Types of Barriers to Vaccination

- **Patient factors**
 - Concerns, misconceptions
 - Lack of awareness
 - Mistrust
 - Cultural/ethnic issues
- **Provider factors**
 - Competing demands
 - Missed opportunities
- **System factors**
 - Practices may have limited available resources
 - Unavailability of vaccine in physician practices
- **Environmental factors**
 - Inconvenient access
 - No regular health care provider
 - Lack of health insurance



Strategies to Increase Immunization Rates



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Task Force on Community Preventive Services Improving Adult Vaccination Coverage (1)

- **Provider or systems-based interventions**
 - **Reminder and recall systems***
 - **Computer notification**
 - **Flow sheet or checklist**
 - **Flagging medical record with sticker or stamp**
 - **Assessment and feedback**
 - **Standing orders and policies**
 - **Allow non-physicians to prescribe or deliver vaccines using a protocol**

CDC. MMWR 1999;48(RR-8):1-15



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Task Force on Community Preventive Services Improving Adult Vaccination Coverage (2)

- Increase community demand
 - Patient reminder and recall systems
 - Multifaceted programs including education
 - Regulation
- Enhance access to vaccination services
 - Reduce out-of pocket costs for patients
 - Increase or change hours when services are offered
 - “express lane” for immunizations
 - New settings

MMWR 1999;48(RR-8)



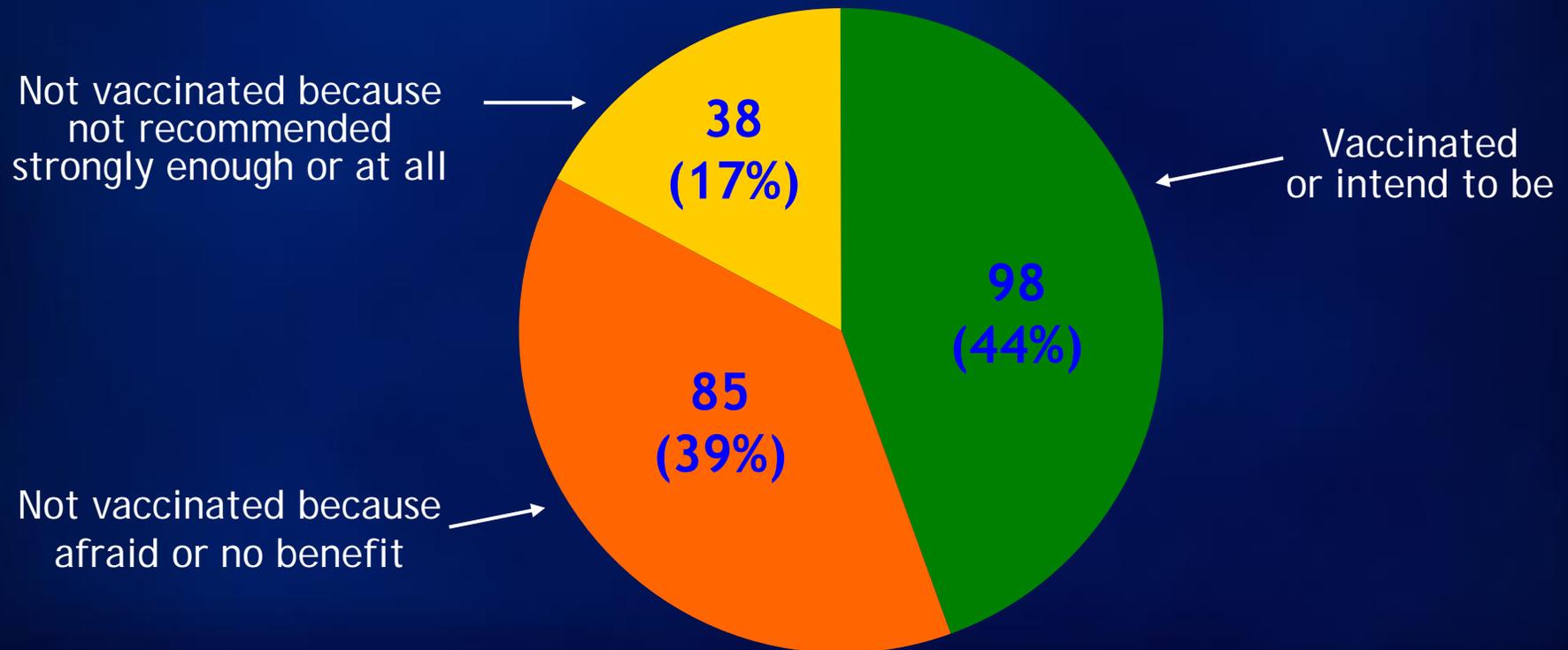
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When Offered Influenza Vaccine, Will Patients Accept?

221 African American patients in Queens, NY, were asked about influenza vaccination before encounter with provider



Nicoleau A et al. *J Am Med Dir Assoc.* 2001;2:56-59.



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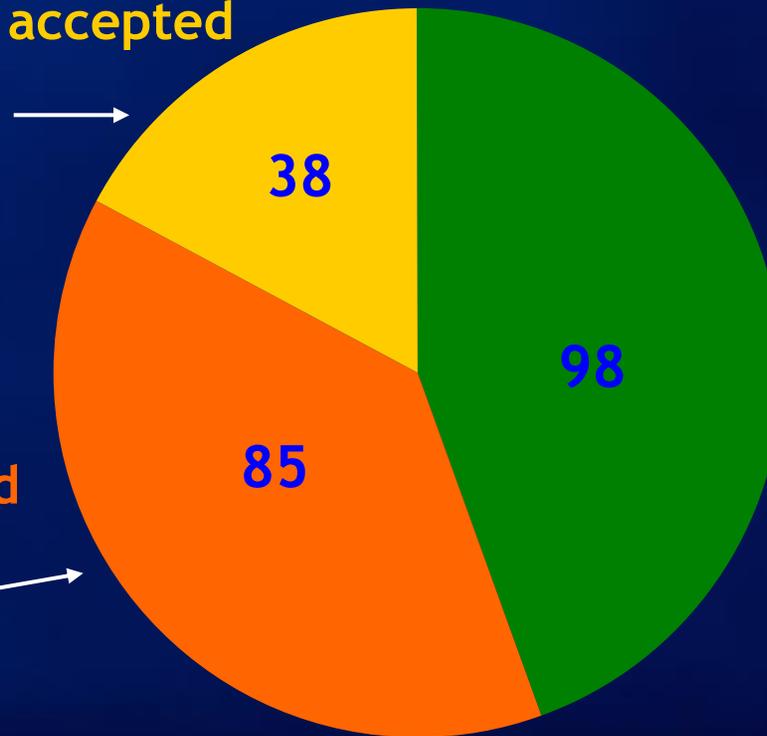
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When Offered Influenza Vaccine, Will Patients Accept? (cont'd)

When physicians offered influenza vaccine to patients

33/38 (87%) accepted

Not vaccinated because
not recommended
strongly enough or at all



Vaccinated
or intend to be

8/85 (9%) accepted

Not vaccinated because
afraid or no benefit

Nicoleau A et al. *J Am Med Dir Assoc.* 2001;2:56-59.

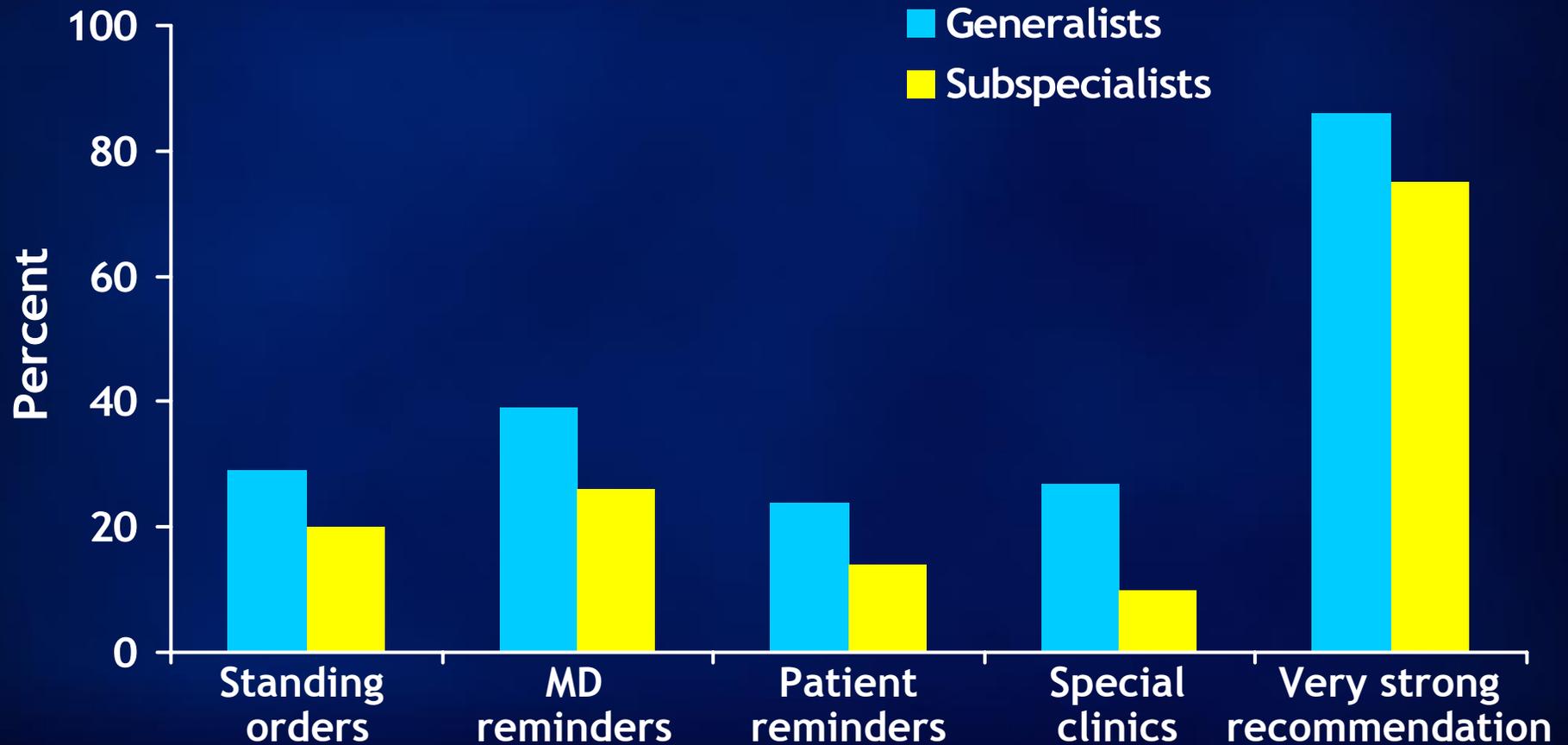


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Strategies Used by Physicians to Promote Influenza Vaccination



Nichol KL, Zimmerman R. *Arch Intern Med.* 2001;161:2702-2708.

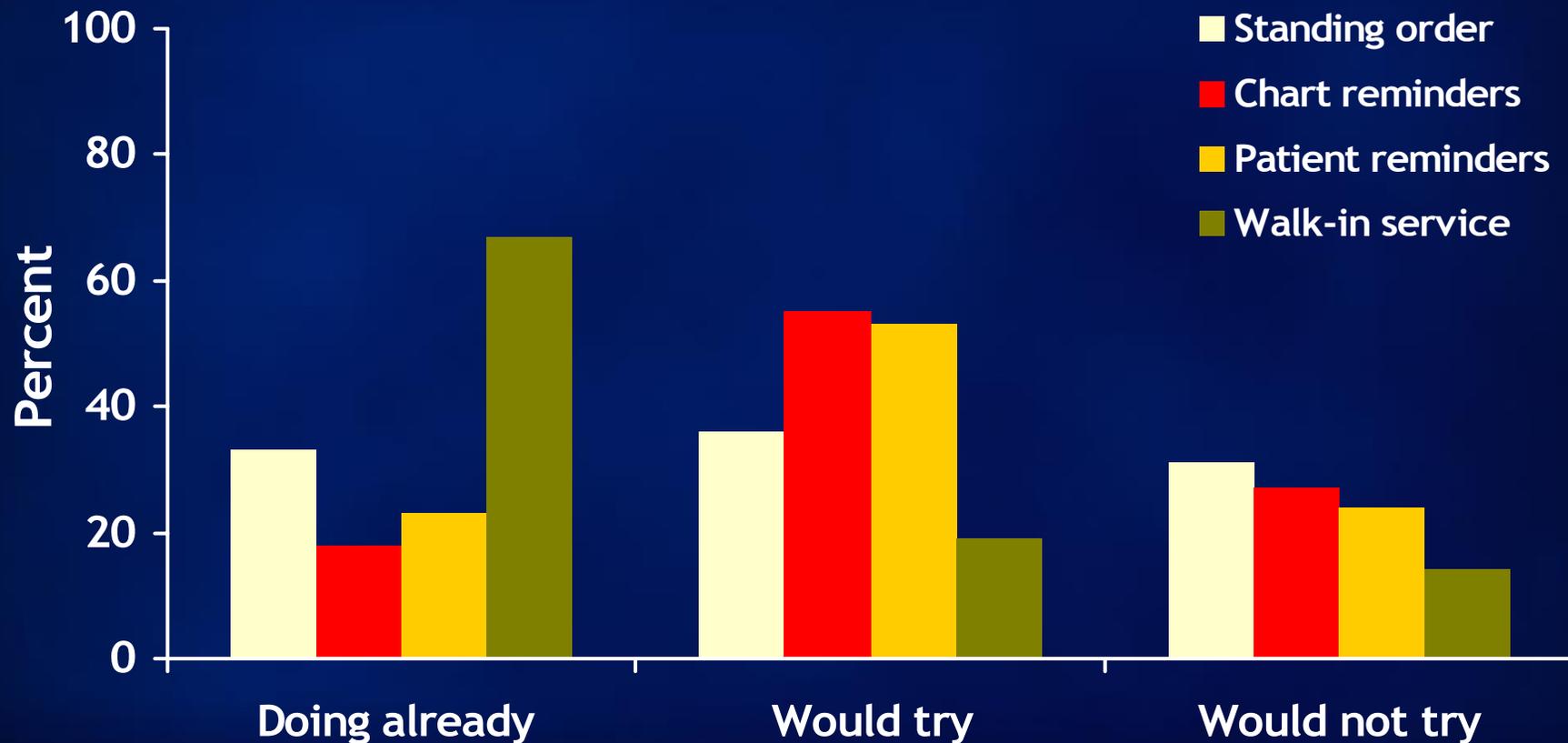


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Primary Care Physician Interest in Strategies to Improve Adult Vaccination Rates



Szilagyi PG et al. *Prev Med.* 2005;40:152-161.



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But...

- **Fewer than 30% of physicians used patient reminders, special clinics, or standing orders**
- **Less than 40% of physicians monitored vaccination rates in their practices**

Nichol K, Zimmerman R 2001 Arch Intern Med;161:2702-2708



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Meta-Analysis of Interventions That Increase Adult Immunization Rates

Intervention	Odds Ratio*
Organizational change (eg, standing orders, separate clinics devoted to prevention)	16.0
Provider reminder	3.8
Provider education	3.2
Patient financial incentive	3.4
Patient reminder	2.5
Patient education	1.3

*Compared with usual care or control group; adjusted for all remaining interventions.

Stone EG et al. *Ann Intern Med.* 2002;136:641-651.



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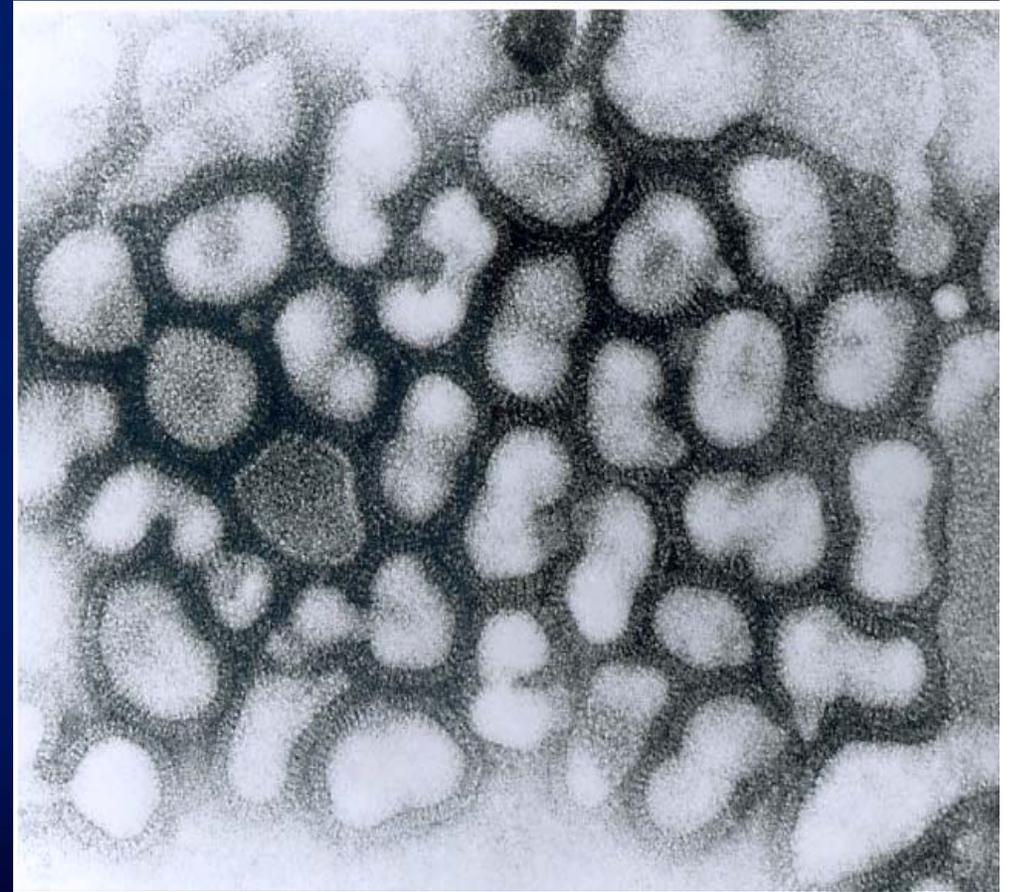
Summary

- **Vaccine-preventable disease burden is high, but vaccine coverage is still low**
- **There are strategies to improve coverage, but they are underutilized or need improvement**
- **What can health care providers do now?**
 - **Set an example: get vaccinated**
 - **Establish a culture of immunization in your practice: educate, monitor**
 - **Institute patient/provider reminders**
 - **Prevent missed opportunities**
 - **Implement standing orders**
 - <http://www.immunize.org/catg.d/p3074.pdf>



Influenza Update

- **2008-2009 Vaccine**
 - **A/Brisbane/10/2007 (H3N2)**
 - **A/Brisbane/59/2007 (H1N1)**
 - **B/Florida/4/2006 (Yamagata lineage)**



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Influenza Vaccine Recommendations, 2008: Adults

- Any adult who wants to reduce the risk for becoming ill with influenza or of transmitting it to others
- 50 years and older
- Pregnant during influenza season
- Chronic pulmonary, cardiovascular, renal, hepatic, hematological, metabolic disorders
- Immunosuppression
- Conditions which compromise respiratory function or handling of respiratory secretions
- Residents of nursing homes and chronic care facilities
- Health-care personnel
- Household (HH) contacts and caregivers of children less than 5 years and adults 50 years and older
- HH contacts/caregivers of persons with medical conditions that put them at high risk for severe complications



Timing of Vaccination

- As soon as vaccine is available
- Continue throughout influenza season
- Vaccine protection reliable 2 weeks after vaccination



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Influenza Vaccine and Thimerosal

- **Thimerosal in vaccines has not been proven to be associated with neurological adverse events (e.g., autism)**
- **All childhood vaccines are available with at most trace amounts (i.e., preservative-free) of thimerosal**



Vaccination in the Elderly Population

- Only randomized controlled trial in elderly does demonstrate efficacy
 - VE lower in elderly
- Influenza is a common and serious infection, and even modest effectiveness can result in significant public health benefit
- Influenza vaccines are well-tolerated in the elderly



Influenza Vaccines Available in 2008-2009

Vaccine	Package	Dose	Age	Thimerosal
Fluzone (sanofi pasteur)	Multi-dose vial	Age-dependent	≥6 mos	Yes
	Single dose syringe	0.25 mL	6-35 mos	No
	Single dose syringe	0.5 mL	≥36 mos	No
	Single dose vial	0.5 mL	≥36 mos	No
Fluvirin (Novartis)	Multi-dose vial	5.0 mL	≥4 yrs	Yes
	Single dose syringe	0.5 mL	≥4 yrs	Trace
Fluarix (GSK)	Single dose syringe	0.5 mL	≥18 yrs	Trace
FluLaval (GSK)	Single dose syringe	0.5 mL	≥18 yrs	Yes
Afluria (CSL Biotherapies)	Single dose syringe	0.5 mL	≥18 yrs	No
	Multi-dose vial	5.0 mL	≥18 yrs	Yes
LAIV (MedImmune)	Single dose sprayer	0.2 mL	<u>2-49</u> yrs	No



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Resources

- Email
 - nipinfo@cdc.gov
- Websites
 - <http://www.cdc.gov/vaccines>
 - <http://wwwn.cdc.gov/travel/default.aspx>
 - <http://www.cdc.gov/flu>
- Phone
 - 800-CCDC-INFO (800-232-4636)

